

AMENDMENTS TO THE CLAIMS

Claim 1 (Previously presented) An extrusion-free wet cleaning process for post-etch Cu-dual damascene structures, the process comprising:

- 5 providing a wafer comprising a silicon substrate and at least one post-etch Cu-dual damascene structure, the post-etch Cu-dual damascene structure having a via structure exposing a portion of a Cu wiring line electrically connected with an N⁺ diffusion region of the silicon substrate and a trench structure formed on the via structure;
- 10 executing an oxidation step by applying a diluted H₂O₂ solution to the wafer to slightly oxidize the surface of the exposed Cu wiring line; and
- washing away cupric oxide generated in the oxidation step by means of a cupric oxide cleaning solution containing diluted HF, NH₄F or NH₂OH having a pH of above 7.

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Claim 2 (Original) The process of claim 1 wherein the Cu wiring line electrically connected with an N⁺ diffusion region of the silicon substrate serves as a cathode in the cupric oxide cleaning solution.

- 20 Claim 3 (Currently amended) The process of claim 1 ~~wherein the method of preventing Cu reduction reactions on the Cu wiring line comprises further comprising~~ purging inert gas onto the wafer during the application to the wafer of the diluted H₂O₂ solution.

- 25 Claim 4 (Currently amended) The process of claim 1 ~~wherein the method of preventing Cu reduction reactions on the Cu wiring line comprises further comprising~~ adding a Cu corrosion inhibitor to the diluted H₂O₂ solution.

- Claim 5 (Original) The process of claim 4 wherein the Cu corrosion inhibitor
30 comprises benzotriazole (BTA).

Claim 6 (Currently amended) The process of claim 1 ~~wherein the method of~~

~~preventing Cu reduction reactions on the Cu wiring line comprises further~~
comprising reducing the H_2O_2 concentration of the diluted H_2O_2 solution to
below 100:1 (v/v) of solvent to H_2O_2 .

- 5 Claim 7 (Currently amended) The process of claim 1 ~~wherein the method of~~
~~preventing Cu reduction reactions on the Cu wiring line comprises further~~
comprising lowering the temperature of the diluted H_2O_2 solution to below 15°C
during the application to the wafer of the diluted H_2O_2 solution.

- 10 Claims 8-19 (Cancelled)